

Claims

What is claimed is:

1. An architectural system comprising:

a triangular base comprising:

first, second and third complete struts substantially aligned along first, second and third axes (AB, BC, and AC) respectively, the axes all contained within a base plane, the first and third axes forming a first base angle CAB, the first and second axes forming a second base angle ABC, the second and third axes forming a third base angle BCA, one or more of the struts each comprising at least two rigid pieces able to move apart so as to produce a strut elongation;

a first node A engaging the first and third complete struts, the first node A “large enough” to maintain the first base angle CAB at a first positive value about equal to $[j \times 20.9^\circ + k \times 31.7^\circ + m \times 36^\circ + n \times 37.4^\circ]$, where j, k, m and n are each an integer less than three;

a second node B engaging the first and second complete struts, the second node B large enough to maintain the second base angle ABC at a second positive value about equal to $[q \times 20.9^\circ + r \times 31.7^\circ + s \times 36^\circ + t \times 37.4^\circ]$, where q, r, s, and t are each an integer less than three;

a third node C engaging the second and third complete struts, the third node C large enough to maintain the third base angle BCA at a third positive value less than 60° ; and

an extension engaging the triangular base and comprising a fourth complete strut substantially aligned along a fourth axis that forms a substantially acute angle $> 3^\circ$ with the base plane.

2. The architectural system of claim 1 in which the fourth axis form an angle DAB with the first axis that is substantially equal to a reference angle selected from a group consisting of 13.3°, 15.5°, 20.9°, 22.2°, 31.7°, 35.3°, 36°, 37.4°, 37.8°, 41.8°, 44.5°, 45°, 54.7°, 58.3°, 60°, 63.4°, 65.9°, 69.1°, 70.5°, 72°, 75.5°, 76.7°, 79.2°, 82.2°, 90°, 97.8°, 100.8°, 103.3°, 104.5°, 108°, 109.5°, 110.9°, 114.1°, 116.6°, 120°, 121.7°, 125.3°, 135°, 135.5°, 138.2°, 142.2°, 142.6°, 144°, 144.7°, 148.3°, 155.9°, 157.8°, 159.1°, 164.5°, and 166.7°.

3. The architectural system of claim 1 in which the fourth axis form an angle DAB with the second axis that is substantially equal to a reference angle selected from a group consisting of 13.3°, 15.5°, 20.9°, 22.2°, 31.7°, 35.3°, 36°, 37.4°, 37.8°, 41.8°, 44.5°, 45°, 54.7°, 58.3°, 60°, 63.4°, 65.9°, 69.1°, 70.5°, 72°, 75.5°, 76.7°, 79.2°, 82.2°, 90°, 97.8°, 100.8°, 103.3°, 104.5°, 108°, 109.5°, 110.9°, 114.1°, 116.6°, 120°, 121.7°, 125.3°, 135°, 135.5°, 138.2°, 142.2°, 142.6°, 144°, 144.7°, 148.3°, 155.9°, 157.8°, 159.1°, 164.5°, and 166.7°.

4. The architectural system of claim 1 in which the fourth axis form an angle DAB with another of the axes that is substantially equal to a reference angle selected from a group consisting of 13.3°, 15.5°, 20.9°, 22.2°, 31.7°, 35.3°, 36°, 37.4°, 37.8°, 41.8°, 44.5°, 45°, 54.7°, 58.3°, 60°, 63.4°, 65.9°, 69.1°, 70.5°, 72°, 75.5°, 76.7°, 79.2°, 82.2°, 90°, 97.8°, 100.8°, 103.3°, 104.5°, 108°, 109.5°, 110.9°, 114.1°, 116.6°, 120°, 121.7°, 125.3°, 135°, 135.5°, 138.2°, 142.2°, 142.6°, 144°, 144.7°, 148.3°, 155.9°, 157.8°, 159.1°, 164.5°, and 166.7°.

5. The architectural system of claim 4 in which one of the struts has a maximum diameter D and in which one of the nodes has a radius R that is not less than D/2.

6. The architectural system of claim 4 in which the extension comprises a polygon having N sides each occupied by a respective complete strut, the third axis containing one of the N sides, the fourth axis containing another of the N sides.

-16-

7. The architectural system of claim 4 in which $j=0$.
8. The architectural system of claim 4 in which j and q are both even.
- 5 9. The architectural system of claim 4 in which $j=1$.
10. The architectural system of claim 4 in which n and t are both even.
11. The architectural system of claim 4 in which each of the nodes has a radius R and in which each of the struts has a respective diameter less than $2R$.
12. The architectural system of claim 4 in which the second node includes first and second couplings respectively engaging the first and second complete struts, the first coupling capable of retaining the first strut under a tension of 100 Newtons along the first axis (AB), the second coupling capable of retaining the second strut under a tension of 100 Newtons along the second axis (BC).
13. The architectural system of claim 4 in which the struts are primarily composed of a non-metallic material.
- 20 14. The architectural system of claim 4 in which $m=0$.
15. The architectural system of claim 1 in which $m=0$.
- 25 16. The architectural system of claim 1 in which $j \neq q$.
17. The architectural system of claim 1 in which $q < 2$.

-17-

18. The architectural system of claim 1 in which $k=0$.
19. The architectural system of claim 1 in which k and r are both even.
20. The architectural system of claim 1 in which $k = 1$.
21. The architectural system of claim 1 in which $n=t$.
22. The architectural system of claim 1 in which $j=0$.
23. The architectural system of claim 1 in which j and q are both even.
24. The architectural system of claim 1 in which $j=1$.
25. An architectural system comprising:
 - means for assembling and supporting first, second and third rigid struts substantially aligned in a common plane; and
 - means for supporting a fourth complete strut so as to extend out of the common plane at a substantially acute angle $> 3^\circ$.